IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appl. No.	:	10/817,660	Confirmation No. 3412
Appellant	:	Jonathan Qiang Li	
Filed	:	April 2, 2004	
TC/A.U.	:	2624	
Examiner	:	Mia M. Thomas	
Docket No.	:	10031315-1	

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Table of Contents

Section:

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This Appeal Brief is submitted in response to the Final Office Action mailed August 21, 2007.

Appellant filed a Notice of Appeal on December 21, 2007.

Real Party in Interest

The real party in interest is Agilent Technologies, Inc., assignee of the above captioned patent application. Agilent Technologies, Inc. is a Delaware Corporation having its principal place of business in Santa Clara, California.

Related Appeals and Interferences

There are no related appeals and/or interferences.

Status of Claims

Claims 1-26 are pending in this application, all of which stand rejected. The rejections of claims 1-26 are appealed.

A copy of the claims is attached as a Claims Appendix to this Appeal Brief.

Status of Amendments

No amendments were filed or entered subsequent to the final office action mailed on August 21, 2007.

Summary of Claimed Subject Matter

Independent claim 1 recites a computer readable medium (FIG. 4, 405) including executable instructions for processing training data for a statistical classification application (p. 6, lines 1-4, par. [0022]; p. 7, lines 11-15, par. [0028]). The computer readable medium comprises 1) code for retrieving a plurality of training data structures (p. 7, line 21, par. [0028]; FIG. 4, 412) that each comprise data members corresponding to feature elements and a data member identifying one of a plurality of classes (p. 6, lines 5-9, par. [0023]; FIG. 3, 301); 2) code for processing each of the plurality of training data structures using probabilistic models that are a function of the feature elements to calculate a respective probability indicative of the respective training data structure belonging to its identified class (p. 4, line 1 - p. 6, line 2, pars. [0015]-[0022]; p. 6, lines 10-15, par. [0024]; FIG. 3, 302, 303; FIG. 4, 407, 408); and 3) code for generating a scatter plot (p. 3, lines 4-19, pars. [0012]-[0013]; FIG. 1, 100), using the plurality of training data structures, that visually indicates probabilities of the training data structures belonging to identified classes (p. 6, lines 16-22, par. [0025]; FIG. 3, 304; FIG. 4, 409).

Independent claim 11 recites a method (FIG. 3) for processing training data for a statistical classification application. The method comprises 1) accessing a plurality of training data structures (p. 6, lines 16-22, par. [0025]; FIG. 3, 304) wherein each training data structure includes a plurality of feature variables and a variable identifying one of a plurality of classes (p. 7, line 21, par. [0028]); 2) calculating a respective confidence value for each of the plurality of training data structures that is indicative of a probability of the respective training data structure belonging to its identified class (p. 4, line 1 - p. 6, line 2, pars. [0015]-[0022]; p. 6, lines 10-15, par. [0024]; FIG. 3, 302, 303); and 3) generating a graphical user interface for a scatter plot (p. 3, lines 4-19, pars. [0012]-[0013]; FIG. 1, 100) that visually indicates confidence values for the plurality of training data structures (p. 6, lines 16-22, par. [0025]; FIG. 3, 304).

Independent claim 22 recites a system for processing training data for a statistical classification application. The system comprises means (p. 7, lines 10-19, par. [0028]; FIG. 4, 400, 401, 406, 407, 408) for processing a plurality of training data structures (p. 6, lines 16-22, par. [0025]; FIG. 3, 304) to generate a plurality of confidence values, wherein each of the plurality of training data structures defines feature values and identifies one of a plurality of classes, and wherein the confidence values indicate probabilities of objects having the feature values belonging to the identified classes (p. 4, line 1 - p. 6, line 2, pars. [0015]-[0022]; p. 6, lines 10-15, par. [0024]; FIG. 3, 302, 303; FIG. 4, 407). The system also comprises means (p. 7, lines 10-22; FIG. 4, 400, 401, 402, 406, 409) for displaying a scatter plot (p. 3, lines 4-19, pars. [0012]-[0013]; FIG. 1, 100) using the plurality of training data structures that provides visual indication of probabilities of points belonging to identified classes (p. 6, lines 16-22, par. [0025]; FIG. 3, 304; FIG. 4, 409).

Claim 23, which depends from claim 22, recites a means (p. 7, lines 10-22, par. [0028]; FIG. 4, 400, 401, 402, 403, 406, 410, 411, 413) for annotating points in the scatter plot to indicate probabilities of the plurality of training data structure belonging to identified classes (p. 6, line 23 - p. 7, line 9, pars. [0026]-[0027]).

Claim 24, which depends from claim 22, recites a means (p. 7, lines 10-22, par. [0028]; FIG. 4, 400, 401, 403, 406, 410) for receiving first user input to select a point in the scatter plot (p. 6, lines 21-22, par. [0025]).

Claim 25, which depends from claim 24, recites a means (p. 7, lines 10-22, par. [0028]; FIG. 4, 400, 401, 403, 406, 410) for receiving second user input to reclassify a training data structure corresponding to the selected scatter point (p. 6, lines 25-27, par. [0026]).

Claim 26, which depends from claim 25, recites a means (p. 7, lines 10-22, par. [0028]; FIG. 4, 400, 401, 406, 407, 408) for revising probabilistic models associated with the plurality of classes, wherein the means (p. 7, lines 10-19, par. [0028]; FIG. 4, 400, 401, 406, 407, 408) for processing reprocesses the plurality of training data structures in response to the means for revising, and the means

(p. 7, lines 10-22; FIG. 4, 400, 401, 402, 406, 409) for displaying redisplays the scatter plot using revised probabilities from the means for processing (p. 6, line 16 - p. 7, line 9).

Grounds of rejection to be reviewed on appeal

1. Whether claims 1-12, 22 and 23 should be rejected under 35 USC 102(e) as being anticipated by Loui et al. (US 7,039,239 B2).

2. Whether claims 13-21 and 24-26 should be rejected under 35 USC 103(a) as being unpatentable over Loui et al. (US 7,039,239 B2) in view of Donoho (IEEE Computer Graphics and Applications, July 1988, pp. 51-58).

Argument

1. Claims 1-12, 22 and 23 should not be rejected under 35 USC 102(e) as being anticipated by Loui et al. (US 7,039,239 B2; hereinafter "Loui").

With respect to claim 1, the Examiner asserts that Loui discloses "code for retrieving a plurality of training data structures that each comprise data members corresponding to feature elements and a data member identifying one of a plurality of classes" in col. 3, line 38, which references "a feature extraction stage 12" (FIG. 1) that extracts features from "an input color image 10". *See*, 8/21/2007 Final Office Action, p. 5. Appellant disagrees. More specifically, appellant notes that Loui's feature extraction stage extracts, from an image, features (or feature sets) of *unknown classification*. That is, at the output of the feature extraction stage 12, none of the features (or feature sets) extracted from the image 10 are associated with any sort of "data member identifying one of a plurality of classes". As a result, the outputs of Loui's feature extraction stage 12 are not equivalent to the "plurality of training data structures" that is retrieved by appellant's claim 1.

The Examiner further asserts that Loui discloses "code for processing each of said plurality of training data structures using probabilistic models that are a function of said feature elements to calculate a respective probability indicative of the respective training data structure belonging to its identified class" in FIG. 1, element 28. *See*, 8/21/2007 Final Office Action, p. 6. Again, appellant respectfully disagrees. More specifically, appellant notes that Loui's class probability map 28 is not indicative of the probability of a *training data structure* belonging to its identified class. Rather, the class probability map 28 provides the probabilities of a feature (or feature set) in the image 10 belonging to *each* of a plurality of classes. As noted in the previous paragraph, the feature (or feature sets) extracted from the image 10 are not training data structures, but are instead features that may ultimately be classified using training data structures.

Of note, Loui does disclose the existence and use of "labeled training data 24" (see FIG. 1), which appellant admits is equivalent to claim 1's "plurality of

training data structures". However, Loui only discloses how to use the labeled training data 24 to classify the image 10. Loui does not disclose any method for calculating a probability indicative of whether any item *of the labeled training data 24* belongs to its identified class.

The Examiner also asserts that Loui discloses "code for generating a scatter plot, using said plurality of training data structures, that visually indicates probabilities of said training data structures belonging to identified classes" in FIGS. 10(a)-(e). *See*, 8/21/2007 Final Office Action, p. 6. However, none of FIGS. 10(a)-(e) is a scatter plot. Rather, each of FIGS. 10(a)-(e) illustrates a line graph that shows "the posterior probability for the five cluster probability maps shown in FIGS. 7(a)-(e)." *See*, Loui, col. 3, lines 1-2 and col. 13, lines 26-40. As taught by Loui, the cluster probability maps shown in FIGS. 7(a)-(e) relate to "unsupervised learning" (i.e., learning that does not rely on training data structures such as the labeled training data 24 (FIG. 1)). *See*, Loui, col. 6, line 47 et seq., and especially, col. 10, lines 35-56.

Although Loui does disclose a class probability map for the input image 10 (FIG. 1) in FIG. 9 (col. 2, lines 66-67), it is noted that the class probability map shown in FIG. 9 does not indicate "probabilities of. . .***training data structures*** belonging to ***identified classes***", as required by applicant's claim 1. Rather, the map shown in FIG. 9 only illustrates the probabilities of features (or feature sets) in ***an image*** belonging to ***one particular class***. Furthermore, the map shown in FIG. 9 is not a "scatter plot".

For the above reasons, appellant asserts that Loui is unable to support a prima facie rejection of appellant's claim 1 under 35 USC 102(e). Claim 1 is therefore believed to be allowable.

Claims 2-12, 22 and 23 are believed to be allowable, at least, for reasons similar to why claim 1 is believed to be allowable.

2. Claims 13-21 and 24-26 should not be rejected under 35 USC 103(a) as being unpatentable over Loui et al. (US 7,039,239 B2; hereinafter "Loui") in view of Donoho (IEEE Computer Graphics and Applications, July 1988, pp. 51-58).

With respect to claims 13-21 and 24-26, the Examiner asserts that Loui teaches the elements of base claims 11 and 22, and Donoho teaches the additional limitations set forth in claims 13-21 and 24-26. However, appellant asserts that claims 13-21 and 24-26 are allowable, at least, because 1) they respectively depend from claims 11 and 22, and 2) Donoho does not teach that which is missing from Loui (as discussed in Section 1 of these Remarks/Arguments, *supra*).

3. Conclusion

In summary, appellant asserts that claims 1-26 should be allowed.

Respectfully submitted,
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Claims Appendix

1. A computer readable medium including executable instructions for processing training data for a statistical classification application, said computer readable medium comprising:

code for retrieving a plurality of training data structures that each comprise data members corresponding to feature elements and a data member identifying one of a plurality of classes;

code for processing each of said plurality of training data structures using probabilistic models that are a function of said feature elements to calculate a respective probability indicative of the respective training data structure belonging to its identified class; and

code for generating a scatter plot, using said plurality of training data structures, that visually indicates probabilities of said training data structures belonging to identified classes.

2. The computer readable medium of claim 1 further comprising:

code for annotating points in said scatter plot to indicate probabilities of said plurality of training data structures belonging to identified classes.

3. The computer readable medium of claim 1, wherein said code for generating a scatter plot displays points in said scatter plot using a

predetermined color to indicate training data structures having probabilities below a threshold value.

4. The computer readable medium of claim 1 further comprising:

code for identifying regions of said scatter plot that correspond to said plurality of classes.

5. The computer readable medium of claim 1 further comprising:

code for receiving first input from a user to select a point corresponding to a respective training data structure.

6. The computer readable medium of claim 5 further comprising:

code for displaying values of feature elements of said respective training data structure corresponding to said selected point.

7. The computer readable medium of claim 5 further comprising:

code for displaying an image file associated with an object from which feature elements were derived in response to said code for receiving first input.

8. The computer readable medium of claim 5 further comprising:

code for receiving second input from said user to reclassify said respective training data structure corresponding to said selected point.

9. The computer readable medium of claim 8 further comprising:

code for revising said probabilistic models in response to said code for receiving said second input, wherein said code for processing is operable to recalculate probabilities of said plurality of training data structures belonging to identified classes using said revised probabilistic models.

10. The computer readable medium of claim 5 further comprising:

code for receiving second input from said user to delete said respective training data structure corresponding to said selected point.

11. A method for processing training data for a statistical classification application, the method comprising:

accessing a plurality of training data structures wherein each training data structure includes a plurality of feature variables and a variable identifying one of a plurality of classes;

calculating a respective confidence value for each of said plurality of training data structures that is indicative of a probability of the respective training data structure belonging to its identified class; and

generating a graphical user interface for a scatter plot that visually indicates confidence values for said plurality of training data structures.

12. The method of claim 11 further comprising:

annotating at least a subset of points in said scatter plot with said confidence values.

13. The method of claim 11 wherein visually indicating the confidence values for the plurality of training data structures comprises using a predetermined color to identify training data structures associated with a confidence value below a threshold value.

14. The method of claim 13 wherein said threshold value is determined by receiving input from a user.

15. The method of claim 13 wherein said graphical user interface identifies regions of said scatter plot associated with each of said plurality of classes.

16. The method of claim 13 further comprising:

receiving user input to select a point of said scatter plot.

17. The method of claim 16 further comprising:

displaying values of feature element variables of a training data structure corresponding to said selected point.

18. The method of claim 16 further comprising:

displaying an image file associated with an object from which values, of a plurality of feature variables corresponding to said selected point, were obtained.

19. The method of claim 16 further comprising:

deleting said training data structure corresponding to said selected point in response to further user input.

20. The method of claim 16 further comprising:

reclassifying said training data structure corresponding to said selected point in response to further user input.

21. The method of claim 11 further comprising:

refining probabilistic models after reclassification of at least one of said plurality of training data structures by a user; and

repeating said calculating and displaying in response to said refining.

22. A system for processing training data for a statistical classification application, the system comprising:

means for processing a plurality of training data structures to generate a plurality of confidence values, wherein said each of said plurality of training data structures defines feature values and identifies one of a plurality of classes, wherein said confidence values indicate probabilities of objects having said feature values belonging to said identified classes; and

means for displaying a scatter plot using said plurality of training data structures that provides visual indication of probabilities of points belonging to identified classes.

23. The system of claim 22 further comprising:

means for annotating points in said scatter plot to indicate probabilities of said plurality of training data structure belonging to identified classes.

24. The system of claim 22 further comprising:

means for receiving first user input to select a point in said scatter plot.

25. The system of claim 24 further comprising:

means for receiving second user input to reclassify a training data structure corresponding to said selected scatter point.

26. The system of claim 25 further comprising:

means for revising probabilistic models associated with said plurality of classes, wherein said means for processing reprocesses said plurality of training data structures in response to said means for revising and said means for displaying redisplays said scatter plot using revised probabilities from said means for processing.

Evidence Appendix

None.

Related Proceedings Appendix

None.